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TOZIER, JOSEPHINE.—The Travelers' Handbook. A Manual for Transatlantic Tourists. New York, Funk & Wagnalls Co. 1905. 16mo.

VAMBÉRY, ARMINIUS.—The Story of my Struggles. Memoirs of ———. (4 Illustrations.) London, T. Fisher Unwin. 1904. 2 vols. 8vo.

VIGNAUD, HENRY.—Études Critiques sur la Vie de Colomb avant ses Découvertes. Paris, H. Welter. 1905. pr. 8vo. [*Gift, from the Author.*]

WHEELER, WILLIAM A.—Who Wrote It? An Index to the Authorship of the more noted works in Ancient and Modern Literature. Edited by Chas. G. Wheeler. Boston, Lee & Shepard. 1882. sq. 16mo.

BOOK NOTICES.

Meteorological Results of the Nansen Expedition.—The Norwegian North Polar Expedition, 1893-96. Scientific Results, edited by Fridtjof Nansen. Vol. VI. Meteorology. By H. Mohn. Published by the Fridtjof Nansen Fund for the Advancement of Science. 1905. Pp. xiv + 659. Pls. XX.

In these days of many polar expeditions, both Arctic and Antarctic, and of great expectations regarding the results to be obtained from the study of the scientific observations made during these expeditions, it is a distinct satisfaction to have before us the present volume. Vol. VI of the Nansen Expedition is an admirable reduction and a thoroughly scientific study of the meteorological records made during that memorable voyage of the *Fram*. Professor Mohn, of Christiania, well known the world over for his work in meteorology, has prepared the volume. In the preface Nansen pays a well-merited tribute to Dr. Mohn and to his share in contributing to the scientific success of the Expedition. It was after reading an article by Mohn that Nansen first thought of planning his voyage. "Mohn was one of the few who always believed in the practicability of the plan." He was among those who bade farewell to Nansen's party at Vardö in 1893, and was also the first friend whom Nansen and Johansen met three years later when they again landed at Vardö. Mohn superintended the meteorological equipment, verified the instruments, and planned the meteorological work. It was, therefore, eminently fitting that he should also work up the results, to which labour he has given several years. In the preface the leader of the Expedition also pays a well-merited tribute to Capt. Scott-Hansen, who superintended the meteorological work during the voyage, "thanking him once more for his faithful work during the long polar day and the long, cold polar night."

The meteorological observations embraced the following: Direction and velocity of the wind; pressure; temperature; humidity; amount; form and motion of the clouds; kind and amount of precipitation; direction of motion of the waves; state of the sea; temperature of sea-surface, and phenomena of occasional occurrence. The interesting facts should not escape notice that not only were the observations made with extraordinary care and regularity throughout nearly three years—there being hardly a break in the record—but that the conditions were remarkably uniform, in that the surface was of a homogeneous nature—viz., an ice-covered sea, with a free horizon, and with continents and islands only at a considerable distance. After the return of the *Fram* the instruments were compared with standards. The volume begins with a description of the instruments and the mode of using them (pp. 3-22), together with the reduction of the observations; then follows a tabulation of the reduced values (pp. 25-248), and finally the results deduced from the observations are discussed (pp. 251-539). There are also discussions of *The Temperature of the Polar Ice* (pp. 540-569); *The Distribution of Atmospheric Pressure and Temperature of the Air Around the North Pole* (pp. 570-576); *Barometrical Depressions and their Motion* (pp. 577-587); *The Diurnal and Annual Periods of the Meteorological Elements in the Arctic Circumpolar Sea* (pp. 588-608). There are also added the observations made during the famous sledge expedition of Nansen and Johansen, and at the winter hut on Franz Josef Land (pp. 609-653).

The volume contains so much of interest that we are at a loss to know what to omit in calling attention to the more noteworthy points brought out in this study. The wind is the first meteorological element to be considered. In order to find the diurnal period of wind-direction three groups of seasons were made—(1) dark, (2) sunny, and (3) equatorial, with regular day and night. In the dark season the wind generally shifts against the sun; in the sunny season it generally veers with the sun, while in the equinoctial months the wind, as a rule, veers with the sun, during the night and morning, and against the sun from 10 A. M. to 10 P. M. These interesting and striking results will be of value in any future discussions of the diurnal period of wind-direction. Dr. Mohn does not, at this point, attempt to explain them. The velocity of the wind, as usual, shows a diurnal maximum about noon; the first annual maximum comes in May; the second in September and October; the velocity is greater in cloudy weather than in clear, cloudy conditions being associated with cyclones. In winter there is almost no diurnal period of wind velocity; in spring the range with clear sky is only one-half the range with sky overcast; in summer the range with sky clear is twice as great as with sky overcast; in autumn (except September) the range is much greater with sky overcast. The conclusion reached by Dr. Mohn is that the diurnal period of wind velocity is influenced rather by the *average velocity* during the day than by the change of radiation in the course of the twenty-four hours. Wind velocities over 34 miles an hour are relatively very rare. The highest observed velocity was 40 miles an hour.

Under pressure, the most noteworthy fact is possibly this, that the barometer rises most frequently with north and northwest winds, and falls most frequently with south and southeast winds. This would accord with the usual easterly movement of cyclones. The reduction of the temperature observations shows the ordinary diurnal period with a minimum in the morning and a maximum in the afternoon in March to September, when the sun is above the horizon during some or all of the twenty-four hours. During October-February, when the sun is below, or but slightly above, the horizon—the dark season—the daytime is usually colder than the night. In December the primary maximum comes about midnight, and a secondary maximum in the afternoon. A greater degree of cloudiness is associated with a smaller range of temperature, and *vice versa*. The disappearance of the solar diurnal period of air temperature during the dark season must be ascribed to other causes than solar radiation, and is probably to be found in the effects of wind, the colder, northerly winds prevailing during the day, and the milder, southerly winds during the night. Such an explanation would also account for the irregularity in the occurrence of the maxima and minima.

Weaker winds in all months except July and August mean lower temperatures, and stronger winds higher temperatures. The southerly winds are the warmest in winter, and the northerly the coldest, and this "goes far to show that the 82nd parallel of latitude is hardly influenced by the Siberian cold pole." In summer the slight difference in temperature of the different winds indicates a weak poleward temperature gradient at that season.

There is a regular diurnal period of the amount of cloud in the seasonal means, the day being more cloudy than the night. In every month the amount of cloud is greater with stronger winds. The winter months are remarkably clear, and the summer months very cloudy. The kinds of clouds were recorded regularly, and show the following general results: Cirrus, most frequent during the day; cirro-cumulus, maximum frequency 2 P. M., minimum about 2 A. M.; strato-cumulus, maximum by day; cumulus, very slightly pronounced diurnal period, maximum near noon and minimum at midnight; stratus, maximum in early morning. True cumuli are scarce, even in summer, and it is doubtful whether the cloud occurs at all in its typical form. The direction of cloud movement averages from west-northwest or northwest. The observations of rain and snow were unsatisfactory, but the amount of precipitation was very small. On July 29, 1895, it rained and snowed all day, and the amount measured on the 30th, at 8 A. M., was 0.75 inch. South and southeast winds are usually the rainy winds; northeast and northwest winds are least likely to bring rain or snow. July has the maximum number of rainy days. Fog does not occur in winter; in summer there is fog on more than every alternate day.

The temperature of the polar ice was observed as carefully as possible. The surface of the ice, in all months except June, is found to be warmer than the air. Being snow-covered for most of the year, the ice-surface is prevented from cooling by radiation, and receives heat from the warmer layers below. Other factors doubtless also enter in.

An important discussion of the pressure and temperature around the North Pole is illustrated by means of monthly isobaric and isothermal charts, in the construction of which all available reliable data were employed. The pressure at the North Pole seems to have its maximum (about 30.080 inches) in April, and its minimum (29.882 inches) from June to September, the annual range being only about 0.20 inch. In the winter months the isothermal charts show a cold pole in Siberia and in Greenland, *and also a third at the North Pole.* A study of the barometric depressions noted during the voyage of the *Fram* shows that the track of the vessel cannot be regarded as a stormy one. Depressions passed on all sides of the *Fram,* with a preponderance of those on the westerly side. In the first winter the tracks are chiefly north of the vessel; in the last they are by far most frequent in the south; in the second they are more evenly distributed, with the larger number on the west. The average track is nearly due east. The average rate of progression is 27 to 34 miles an hour.

In his discussion of the meteorological periods in the Arctic, Dr. Mohn considers the various factors which may control the periods which have been discovered, and this portion of the volume is in many respects the most important. Time fails, however, to summarize these conclusions, which are obviously of more interest to the working meterorologist than to the general reader.

Much interest also attaches to the observations made on the famous sledge journey, and at the winter hut. Through storm, and cold, and night, and all manner of hardships and privations the records were faithfully kept with a persistence and a courage bordering on heroism. Let us hear Nansen (p. 613): "We had no lantern for the reading of the thermometer, and I tried in vain to construct one which would not burn more oil than we could afford to use. But our eyes, of course, became gradually trained to see in the dark, and even in midwinter, with no moonlight, there was so much light (star-light?) reflected from the snow that the column of the darkly-coloured metaxylol was dimly visible, and also the figures of the thermometer-scale, but not the division marks. . . . I do not, therefore, consider it advisable to pay too much attention to the temperature observations during the darkest time, December and January, when the moon was not above the horizon."

Let this quotation, which expresses the spirit of the volume before us, serve as a conclusion to a very inadequate notice of one of the most important recent publications in meteorological science. R. DeC. W.

The Saint Lawrence, its Basin and Border-Lands. The Story of their Discovery, Exploration and Occupation. By Samuel Edward Dawson. xl and 451 pp., 42 woodcuts and half-tone illustrations, including early Maps, Bibliography, Index, and large Map in Colours. Frederick A. Stokes Company, New York, 1905. (Price, $1.60.)

Dr. Dawson is well known for his earlier geological writings. The present book is his most comprehensive work. It is a thorough, critical, and interesting study of the discovery and exploration of the northeast coast of our continent and of the wide transverse valley of St. Lawrence to its western limits in the heart of North America. Territory not now British is, in the main, excluded from this history.

The narrative is preceded by an excellent geographical sketch, giving the general features of the regions concerned. The sketch is drawn with skill and marked by a few generalizations, clearly put and very concise, as space was evidently lacking for detailed treatment in this descriptive introduction. The following quotations will show the quality of these generalizations.

> The peculiar "V"-shaped course of the main river [St. Lawrence] valley is due to the fact that the primary Laurentian nucleus of the continent is of that shape, and, along its edge, in an alluvial valley resting on Silurian rocks, the river flows and expands into broad lakes.
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> The characteristics of the Laurentian country, which forms and feeds the great river from the north, are very marked. It is a plateau, two or three hundred miles wide, of ancient hills or mountains 1,000 to 1,600 feet above the sea, rounded in form by the immense lapse of ages and forest-clad to their summits. Myriads of lakes connected by countless mazes of streams gather up the waters which flow down to the lower level in rapids and falls along the entire edge of the valley. At the heads of the streams and their tributaries the waters interlock so that, in the early days of the colony, the Indians would pass from one to the other and bring their furs to market by the Ottawa, St. Maurice or Saguenay, according as one or the other was free from hostile Indians.

This geographical sketch is supplemented with a fine orographical map by Bartholomew, which graphically shows these and other surface features noticed in the text.

The reason is plain why exploration in this vast region was long more vigorously and fruitfully pursued than in other parts of the continent. Explorers here met no such barrier as the ranges of the Appalachians, which so long retarded discovery farther south. They found easy access up the valley to the fresh-water seas, across the portages to other basins, and on to the Mississippi itself. These great explorations were replete with geographic and historic interest and abounded with romantic adventure; and the author tells the story well, for he is in full command of these rich resources for book-making.